Closed-loop PLM for sustainable production & consumption of complex products

A Sustainable Manufacturing MTP initiative

Proposed by

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Closed-loop PLM for sustainable production & consumption of complex products

Inspired by ... PROMISE

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Product Lifecycle Management and Information Tracking using Smart Embedded Systems

EU FP6 IP 507100
IMS 01008

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€14+ Million Invested by

IMS

Information Society Technologies

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BIBA

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IMS PROMISE
Japan, USA, Austalia & South Korea

Japan
Research partners: **University of Tokyo, Waseda University, Chuo University**
Industrial partners **Toyota Motors**

USA
Research partners: **University of Cincinnati, University of Michigan, Stanford University**
Industrial partners: linked with the **Intelligent Maintenance Systems Center** (IMS)

AUSTRALIA
Research partners: **IRIS**.
Industrial partners: **MTI**, **AEEMA**

South Korea
Research partners: **Hankuk Aviation University, KAIST, KITECH**
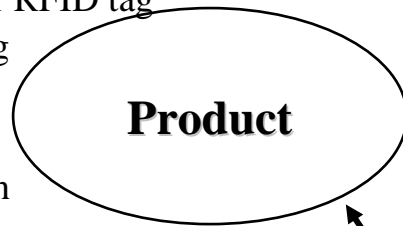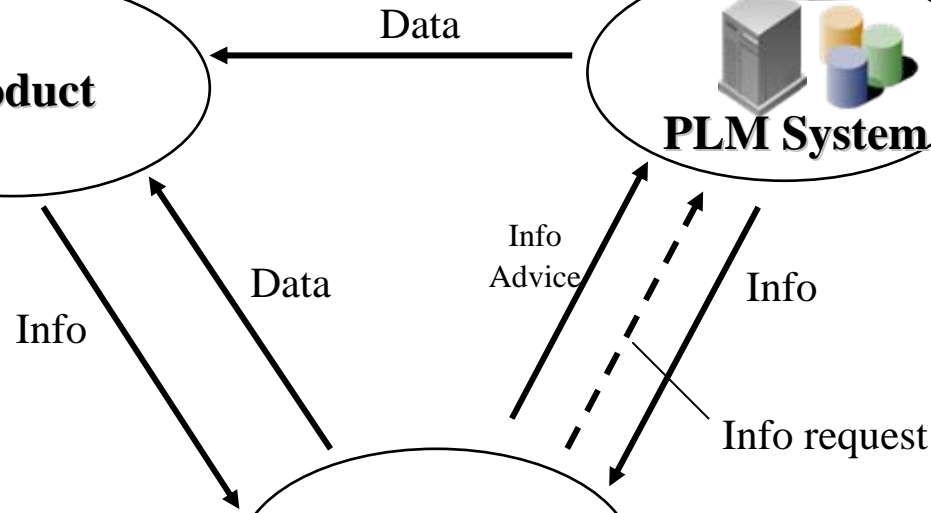**Industrial partners** **SEIL CO Ltd.**

Closed-Loop PLM

PEID (Product Embedded Information Device)

- On-board computer or RFID tag
  - Data processing
  - Memory
  - Power unit
  - Communication unit
  - Sensor reading unit

PDKM

(Product Data Knowledge Management)

Product

Data

PLM System

Data

Info

Info Advice

Info

Info request

PLM agent

- **PEID reader**
- **PDA**
- **Fixed reader with built-in antenna**
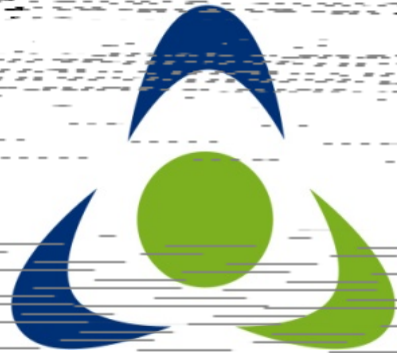
Closing the information loops

What if your product could tell what to do with itself next?

What could you do with that?

Lessons learned

1. The **ultimate goal** of considering product/service lifecycles, PLM and Closed-loop PLM in particular…

   … **is all about SUSTAINABILITY**

2. **Users (consumers)** of products and services are more and more concerned and **need to be involved** in product/service lifecycle operations.

... so the idea comes for the MTP initiative:

**Closed-loop PLM for sustainable
production & consumption of complex products**

PROCOCO

- **Closing product-lifecycle information loops requires involvement of users (consumers) of products.**

- **New business models covering sustainable production and consumption of complex products need to be developed.**

- **Need of support by appropriate software systems and associated ICT infrastructure.**

- *Social implications* **must be considered within the context of sustainable production and consumption.**

knowledge sharing"between "producers" and "consumers"

- **Knowledge sharing** has to be:
  - **Clear**
  - **Fair**

- In every case of knowledge sharing it has to be defined:
  - **What** is to be shared
  - **How** does the sharing happen
    - What are the necessary organisational structures?
    - How any created value is to be shared?
  - **When** the sharing will happen
    - Implications with the **product and business lifecycles**

knowledge sharing" between "producers" and "consumers"

- Knowledge is created by our ability to transform information and already own knowledge.

  - The concept of "**knowledge transformation**" needs to be further investigated and formalised.

- Collaborating organisations should clarify and define their concerns about **confidential information sharing & trust development**.

D-I-K transformations for sustainability
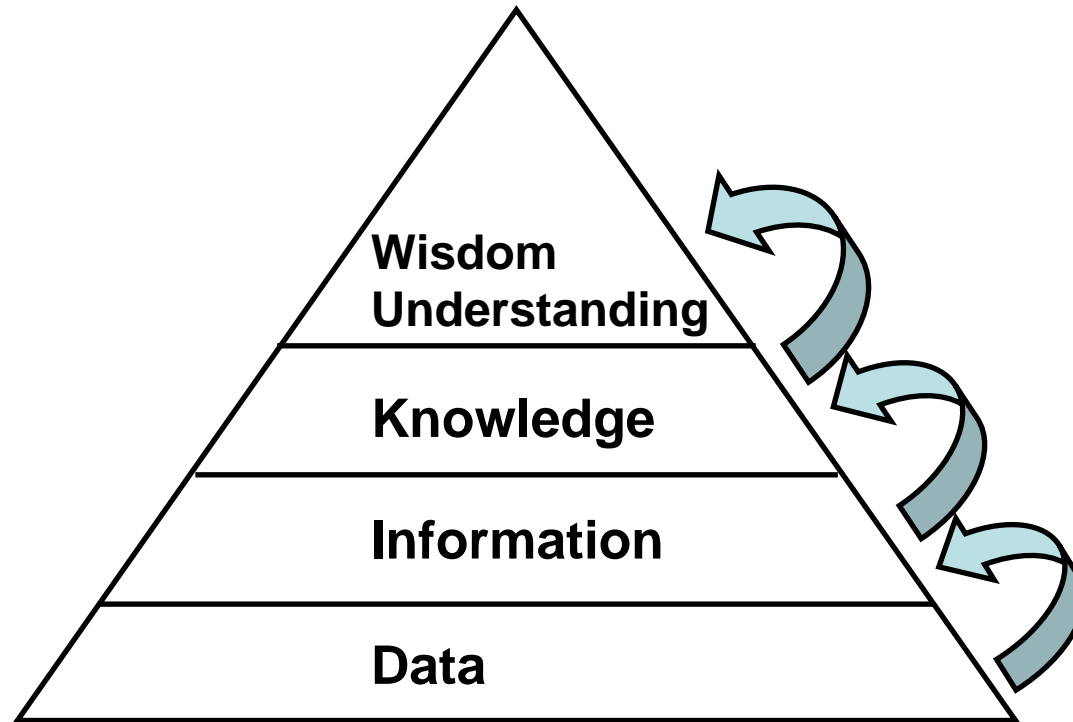
- **Knowledge:** application of data and information; answers "how" questions
- **Understanding:** appreciation of "why"
- **Wisdom:** evaluated understanding

PROCOCO targets

1. **To investigate the presented issues and conceptualize them within the context of closed-loop PLM and**

2. **To define the foundations and specifications of the necessary ICT developments, models and software systems**

    – **that will support the seamless and trustful knowledge sharing among producers and consumers/users of complex products**

    – **so that the concept of sustainable production and consumption is accepted and supported by modern societies.**

Sustain our activities (?)

- **PROMISE (EU & CH) is in the process of creating a**

  European Center of Excellence in Closed-Loop PLM

- **What about creating an IMS network of similar centers?**

Thank you !

Further information:

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